

Expert Report of Kevin M. Murphy

(Nov. 25, 2013)

Cisneros Exhibit 6

REDACTED VERSION

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION

IN RE HIGH-TECH EMPLOYEE
ANTITRUST LITIGATION

THIS DOCUMENT RELATES TO:

ALL ACTIONS.

Master Docket No. 11-CV-2509 LHK

EXPERT REPORT OF PROFESSOR KEVIN M. MURPHY

November 25, 2013

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I. CREDENTIALS

1. My name is Kevin M. Murphy. I am the George J. Stigler Distinguished Service Professor of Economics in the Booth School of Business and the Department of Economics at the University of Chicago, where I have taught since 1983.
2. I earned a doctorate degree in economics from the University of Chicago in 1986. I received my bachelor's degree, also in economics, from the University of California, Los Angeles, in 1981.
3. At the University of Chicago, I teach economics in both the Booth School of Business and the Department of Economics. I teach graduate level courses in microeconomics, price theory, empirical labor economics, and the economics of public policy issues. In these courses, I cover a wide range of topics, including the incentives that motivate firms and individuals, the operation of markets, the determinants of market prices, and the impacts of regulation and the legal system. Most of my teaching focuses on two things: how to use the tools of economics to understand the behavior of individuals, firms and markets; and how to apply economic analysis to data. My focus in both research and teaching has been on integrating economic principles and empirical analysis.
4. Of particular relevance to the issues in this matter, I have published extensively on labor markets and the determinants of wages and compensation. My work in labor economics has addressed the market determinants of wage by skill level as well as the determination of relative wages across industries and occupations. Several of my papers have focused on the determinants of the wage structure by age, education and gender. My work on wage determination also has addressed the links between wages and labor mobility. I teach PhD-level courses on empirical labor economics with a focus on the wage structure and the determinants of relative wages across groups differentiated by age, education and skill.
5. I have authored or co-authored more than sixty-five articles in a variety of areas in economics. Those articles have been published in leading scholarly and professional journals, including the *American Economic Review*, the *Journal of Law and Economics*, and the *Journal of Political Economy*.

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6. I am a Fellow of the Econometric Society and a member of the American Academy of Arts and Sciences. In 1997, I was awarded the John Bates Clark Medal, which the American Economic Association awarded once every two years to an outstanding American economist under the age of forty.¹ In 2005, I was named a MacArthur Fellow, an award that provides a five-year fellowship to individuals who show exceptional merit and promise for continued and enhanced creative work.

7. In addition to my position at the University of Chicago, I am also a Senior Consultant to Charles River Associates ("CRA"), a consulting firm that specializes in the application of economics to law and regulatory matters. I have consulted on a variety of antitrust, intellectual property and other matters involving economic and legal issues such as mergers, class certification, damages, labor practices, joint ventures, and allegations of anticompetitive exclusionary access, tying, price fixing, and price discrimination.

8. I have submitted testimony in Federal Court, the U.S. Senate and to state regulatory bodies, and I have submitted expert reports in numerous cases. I have testified on behalf of the U.S. Federal Trade Commission and I have consulted for the U.S. Department of Justice. A list of the reports I have filed and the testimony I have given over the past four years is provided in my CV, attached as Appendix A. CRA is being compensated at a rate of \$1,250 per hour for my work on this matter.

II. ASSIGNMENT AND SUMMARY OF CONCLUSIONS

9. I have been asked by Counsel for Apple Inc. ("Apple") to evaluate whether the bilateral "Do Not Cold Call" ("DNCC") agreements between Apple and certain other Defendants would likely have a meaningful impact on class-wide compensation. As part of my analysis, I reviewed the reports submitted on behalf of Plaintiffs by Dr. Matthew Marx and Dr. Alan Manning and considered whether those reports support Plaintiffs' claim that the alleged conspiracy and, in particular, Apple's bilateral DNCC agreements, would have the effect of suppressing compensation of Defendants' employees.

¹ The John Bates Clark Medal was awarded biennially until 2009, but it now is awarded annually. See, http://www.aeaweb.org/honors_awards/clark_medal.php.

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10. Many of the claims made by Drs. Marx and Manning repeat, restate, refer to or rely on claims made in the class certification reports of Dr. Edward E. Leamer.² I addressed many of these claims in my reports dated November 12, 2012 ("Murphy Initial Report") and June 21, 2013 ("Murphy Supplemental Report"), which I attach as Appendices E and F, respectively. I incorporate those reports (which I refer to as my "class reports") as part of the analysis and opinions I offer here.³

11. Based on the materials I reviewed in preparing this and my previous reports, my review of the reports submitted by and deposition testimony of Drs. Marx and Manning, and on my professional experience as an economist studying labor markets for over 30 years, I conclude that Plaintiffs' claims and the opinions of Drs. Marx and Manning are inconsistent with economic theory and contradicted by economic analysis and empirical evidence. The following are the core opinions that I explain in detail in this report:

- a) Economic theory and empirical evidence show that the challenged bilateral DNCC agreements were not anticompetitive and did not reduce the compensation of the broad group of employees in the Class certified by the Court;
- b) There are business reasons for entering into the challenged agreements that are unrelated to reducing the compensation of employees;
- c) Dr. Marx applies the wrong framework when analyzing the challenged agreements; and
- d) Dr. Manning's theory that Defendants' labor markets are "imperfect" and his conclusion that, as applied here, that theory (and evidence he reviewed) means it is likely that Plaintiffs' suffered a reduction in compensation as a result of the alleged conspiracy are improper.

² I have not been asked to review and comment on the October 28, 2013 expert report of Dr. Leamer or the October 27, 2013 report of Dr. Kevin F. Hallock

³ A list of the materials on which I relied for this report is attached as Appendix B.

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III. THE BILATERAL AGREEMENTS ARE NOT ANTICOMPETITIVE

A. There Is No Evidence of an Anticompetitive Effect Associated with the Agreements

1. Plaintiffs Challenge a Small Number of Bilateral Agreements

12. I understand that Plaintiffs challenge as anticompetitive only a small number of bilateral agreements:⁴

- Apple's agreements with Adobe, Google, and Pixar;
- Google's agreements with Intel and Intuit; and
- Pixar's agreement with Lucasfilm.

I understand that Plaintiffs do not claim that other pairs of Defendants engaged in unlawful DNCC agreements, or that Defendants had unlawful agreements with any non-Defendant companies. Therefore, the relevant issue for understanding Plaintiffs' allegations is whether these few agreements had a class-wide impact on compensation of what Plaintiffs call the "Technical, Creative and Research & Development" employees of all Defendants (the "Class"), a class that was certified by the Court.⁵

2. I Have Not Seen, and Plaintiffs Have Not Presented, Any Evidence that the Challenged Agreements Lowered Total Compensation

13. The allegations in this matter concern the impact of the challenged agreements between pairs of Defendants to eliminate cold calling on the compensation received by members of the Class. The bilateral agreements did not prohibit cold calling of employees at Defendants with which a firm did not have a bilateral agreement or at any other companies with which a firm had no agreement, restrict other recruiting channels, prohibit hiring employees of any Defendant, limit how many employees could be hired, or fix wages or any other element of compensation.⁶

14. In my class certification reports, I examined the analyses that had been put forth by Dr. Leamer and found that he had not shown that the challenged agreements reduced the

⁴ Complaint at ¶108. *See also* Marx Report at ¶16 and Figure 1 of Dr. Leamer's October 1, 2012 Report.

⁵ *See* Order Granting Plaintiffs' Supplemental Motion for Class Certification (Case No. 11-CV-02509-LHK), Oct 24, 2013 at 7,10-11 and 17.

⁶ *See* Murphy Class Certification Report, January 17, 2013 at ¶27.

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compensation of all or nearly all of the Class. Specifically, as I discussed in my class reports, Dr. Leamer's analyses, and his conduct regressions in particular, suffer from several conceptual and methodological flaws and are completely unreliable and thus uninformative.⁷

15. Contrary to Plaintiffs' claims, the challenged agreements were not commitments to lower compensation of the Class as a whole.⁸ The bilateral agreements would not have changed the supply of or demand for labor overall or the number of open jobs that the Defendants desired to and did fill. The alleged agreements only affected recruiting of certain employees through a particular method (cold calling).

16. As a matter of economic theory, the impact of eliminating supply to the market from one source will depend on the fraction of total supply that is restricted and the elasticity of market supply—or the extent to which supply to the market from other sources increases when supply from one source is reduced. Here, Plaintiffs allege that the challenged agreements reduced “job opportunities and the information available about labor market conditions,”⁹ but they provide no empirical evidence of the extent to which these claimed restrictions could or did reduce the total supply of labor or the market supply elasticity. As I explained in my class reports, economic analysis shows that the restrictions would not have reduced supply or affected the market supply elasticity, and thus would not have affected compensation of the Class generally. Even if the agreements reduced the recruiting of certain employees by particular employers and potentially affected certain individuals as a result, Defendants then would have had an incentive to increase recruiting through other unrestricted channels, which would benefit those who were cold called and those who were hired by Defendants through those other channels. For example, if, as a result of an alleged agreement with Adobe, Apple recruited a new employee for an open position from a non-Defendant, such as Cisco, rather than from Adobe, the person hired from Cisco (a member of the Class) benefitted from the bilateral agreement between Apple and Adobe. The former Cisco employee otherwise would not have been hired for that position because the job would have gone to an Adobe employee.

⁷ See Murphy Initial Report Section V.E.

⁸ See, for example, Marx Report at ¶6d (“It is clear from the evidence that the Anti-Solicitation agreements were established for the purpose of suppressing compensation.”), ¶¶8ii, 76.

⁹ Manning Report at ¶8b.

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17. Even if, as the result of the alleged conspiracy, some members of the Class received lower compensation because those members did not receive a cold call that would have provided information about a job opening, information about compensation for the position, or possibly a job offer, this does not mean that information was reduced for Class members generally. The necessary corollary of limiting information and opportunity for one potential candidate is that there would be increased information and potential opportunities to others, including members of the Class. Under Plaintiffs' theory, restricting one Defendant from cold calling into a small number of other Defendants provides information to and opens up opportunities for employees at non-Defendant firms and at other Defendants (as well as for that Defendant's current employees as I explained in my previous reports) that they otherwise would not have received.

3. The Type of Language that Drs. Marx and Manning Claim Shows that the Purpose of Apple's Bilateral Agreements was to Lower Compensation Provides no Economic Support for Plaintiffs' Claims

18. In his report, Dr. Manning cites correspondence between the Defendant firms that contains "strong" or "intense" language that he says shows that a purpose of the alleged conspiracy was to limit what otherwise would have been "intense" competition between Defendants for employees.¹⁰ Similarly, Dr. Marx suggests that language indicating that the CEOs were "embarrassed" when another firm poached its employee shows that the agreements suppressed wages.¹¹ As a matter of economics, however, one cannot infer a link between the type of language cited by Drs. Marx and Manning and an intention to suppress compensation, let alone an impact on compensation.¹²

B. The Challenged Bilateral Agreements Are Not Anticompetitive Because They

¹⁰ Manning Report at ¶20 ("I think it is clear that the Defendants knew that one of the purposes of the conspiracy was to limit competition amongst themselves for workers and likely that this competition would have been intense in the absence of the agreements, as is evidenced by the use of metaphors involving terminology from violent conflict"). *See also* Manning Dep. at 122:13-17; 161:20-162:7, and 273:4-9.

¹¹ Marx Report at ¶29d. *See also* Marx Report at ¶6d ("It is clear from the evidence that the Anti-Solicitation agreements were established for the purpose of suppressing compensation. Certain coconspirators used the pretext of 'embarrassment' as justification, while others were clear in their desire to stem the outward flow of talent to competitors who were growing quickly, with no mention of technical collaborations), Marx Report at ¶38.

¹² At his deposition, Dr. Marx could not recall seeing a document in which an Apple executive stated that the purpose for the agreement was to suppress employee compensation. *See* Marx Dep. at 285:5-8. ("I can't currently recall an explicit admission that [suppressing compensation] is the purpose for which they entered into these agreements.")

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Could Not Cause a Systematic Reduction in Compensation for All (or Nearly All) Members of the Class

1. The Challenged Bilateral Agreements Had No Meaningful Impact on Defendants' Sources of Hires

19. As I explained in my previous reports, Defendants compete in broad labor markets, and thus could not affect competition in those markets or materially and systematically impact compensation of all (or nearly all) Class members. Exhibit 1 below, which is based on employee compensation data, shows the hires and separations of employees who worked in Class positions across all seven Defendants.¹³ Before and after the alleged conspiracy, 0.6 and 1.7 percent, respectively, of Defendants' hires for Class positions came from other Defendants, while the rest (nearly 99 percent) of those hires were from non-Defendants. Similarly, before and after the alleged conspiracy, 0.7 and 3.9 percent, respectively, of employees who separated from one Defendant were subsequently employed by another Defendant. During the alleged conspiracy, the share of Defendant hires from other Defendants was 1.3 percent, and the share of separations to other Defendants was 1.8 percent. These shares do not differ much from the shares before and after the alleged conspiracy, and thus do not suggest that the alleged conspiracy had any meaningful impact on employee movements between Defendants with DNCC agreements.

¹³ The exhibit includes any employee who worked in a Class position if even the employee was not in the Class at the time of the hire or separation. Murphy Initial Report Table 1 shows similar information, but for Dr. Leamer's "All Employee Class."

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Exhibit 1

Summary of Hires and Separations at Defendant Companies

Class Positions

	Annual Average			
	<u>2001- 2004</u>	<u>2005- 2009</u>	<u>2010- 2011</u>	<u>2001- 2011</u>
Overall Hires	3,090	5,210	7,117	4,786
From Other Defendant Companies	20	64	115	57
From Other DNCC Defendant Companies	9	33	63	30
% From Other Defendant Companies	<u>0.6%</u>	<u>1.3%</u>	<u>1.7%</u>	<u>1.1%</u>
% From Other DNCC Defendant Companies	<u>0.3%</u>	<u>0.7%</u>	<u>0.9%</u>	<u>0.6%</u>
Overall Separations	2,800	3,848	2,890	3,293
To Other Defendant Companies	19	67	112	58
To Other DNCC Defendant Companies	10	35	62	31
% To Other Defendant Companies	<u>0.7%</u>	<u>1.8%</u>	<u>3.9%</u>	<u>1.8%</u>
% To Other DNCC Defendant Companies	<u>0.4%</u>	<u>0.9%</u>	<u>2.1%</u>	<u>1.0%</u>
Overall Hires and Separations	5,889	9,058	10,007	8,078
From/To Other Defendant Companies	39	130	227	114
From/To Other DNCC Defendant Companies	19	69	125	61
% From/To Other Defendant Companies	<u>0.7%</u>	<u>1.5%</u>	<u>2.3%</u>	<u>1.3%</u>
% From/To Other DNCC Defendant Companies	<u>0.3%</u>	<u>0.8%</u>	<u>1.3%</u>	<u>0.7%</u>

Note: DNCC Defendants are based on the following pairs of firms that have challenged agreements: Adobe and Apple, Apple and Google, Apple and Pixar, Google and Intel, Google and Intuit, and Lucasfilm and Pixar.

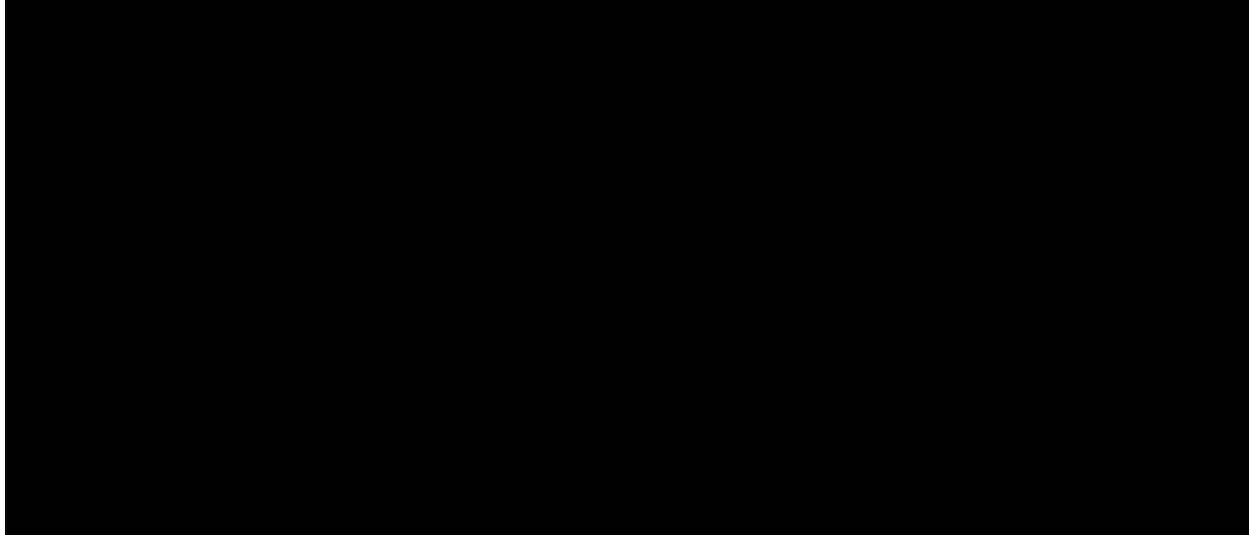
Source: Dr. Leamer 10/1/2012 Report backup data and materials.

20. Exhibit 2 below provides a comparable analysis of hiring data for Apple. From 2001 through 2011, Class hires from other Defendants accounted for at most [REDACTED] of Apple's Class hires in any given year. Hires from Defendants with which Apple had a challenged DNCC agreement accounted for at most [REDACTED] of Apple's total Class hires in any given year.¹⁴

¹⁴ See also Murphy Initial Report Table 1, and Exhibits 1A, 1B, and 4B.

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Exhibit 2
Hires from Other Defendants Account for
a Very Small Share of Apple's Annual Hires
Class Positions



Notes:

- [1] A hire is classified as "From a Defendant" if he/she was employed by Apple within 12 months of separating from a different Defendant.
- [2] Employees who were previously employed by Apple within one year of being rehired are excluded from the analysis.
- [3] Defendants classified as having a DNCC agreement with Apple include Adobe, Pixar, and Google.
- [4] The chart includes any employee who worked in a Class position if even the employee was not hired into a Class position.
- [5] Similar charts for the other six defendant firms are provided in Appendix C.

Source: Dr. Leamer 10/1/2012 Report backup data and materials.

21. Exhibits 1 and 2 illustrate several important features of the Defendants' labor markets. First, the total number of Class hires from and separations to other Defendants accounted for a very small share of the Defendants' overall Class hires and separations. The fact that nearly 99 percent of the hires were from and separations were to non-Defendants indicates that the firms operated in a very broad labor market where the vast majority of Class employees' employment options were outside Defendant firms.¹⁵ Second, the number of Class hires and separations from other Defendants with which a Defendant had a DNCC agreement was even smaller.¹⁶ Third, the share of Class hires from and separations to Defendants (and from and to Defendants with which a particular Defendant had a DNCC agreement) was roughly the same before, during, and

¹⁵ For the period 2001 through 2011, the share of Defendant hires from non-Defendants was 98.9 percent and the share of Defendant separations to non-Defendants was 98.2 percent.

¹⁶ For the period 2001 through 2011, the share of hires from and separations to Defendant firms with challenged DNCC agreements were 0.6 and 1.0 percent, respectively.

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after the alleged conspiracy period. The fact that the Defendants' shares of hires and separations were roughly the same before, during, and after the alleged conspiracy period suggests that the challenged agreements did not have a meaningful impact on employment flows between Defendants. It is therefore unlikely that the agreements would have had a meaningful impact on the information available to a Defendant's employees, let alone a meaningful impact on compensation and certainly not an impact of the magnitude that Dr. Leamer claims to have estimated.¹⁷

22. Exhibits 1 and 2 are based on Defendants' compensation data. In my initial report, I performed a similar analysis of cross hiring using Defendants' recruiting data.¹⁸ Murphy Initial Report Exhibit 3 shows the top 20 previous employers of new hires at each of the Defendants. Exhibit 3, below, provides the same analysis for hires into Class positions at Apple, and has been expanded to show the top 40 previous employees. A striking observation from this exhibit is that no single firm (including no other Defendant) accounted for more than two percent of Class hires at Apple, and that the top 40 firms combined account for less than half of total hires.¹⁹ Thus, even a policy that eliminated all hiring from other Defendants – which is much stronger than the limitation on a single recruiting channel from certain Defendants during certain periods that Plaintiffs challenge here – would not meaningfully affect the flow of information to Apple employees.

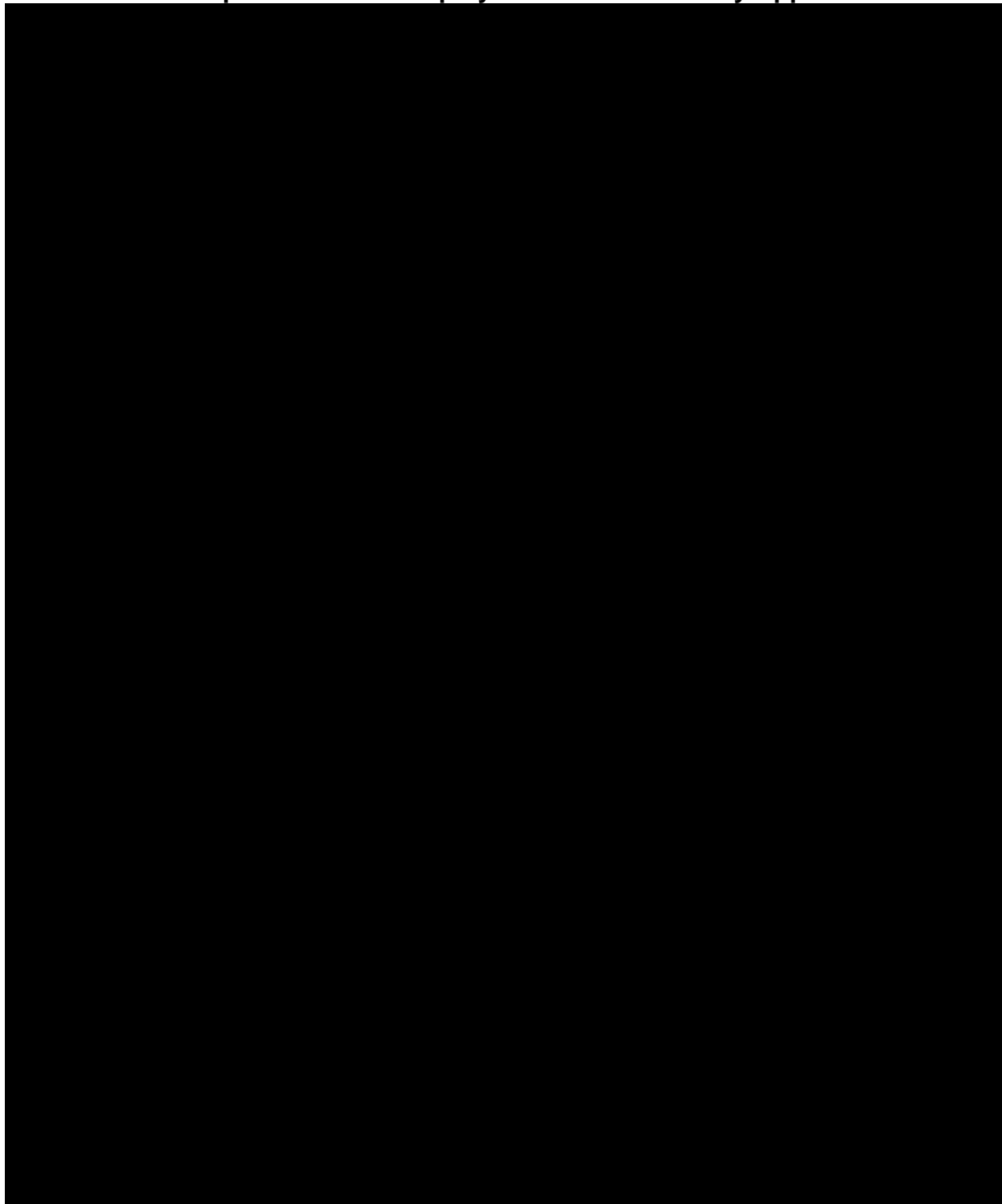
¹⁷ Dr. Manning referred to Dr. Leamer's estimates in his depositions and stated that he believed that estimates were the "best estimates" available. *See* Manning Dep. at 75:18-20 ("And I think the Dr. Leamer's methodology is appropriate and so I think his estimates are the best estimates") and at 348:4-6 ("I think Dr. Leamer's estimates emerge as the best estimates we have.").

¹⁸ My analysis using compensation data identifies cross-hires by matching (hashed) social security numbers across Defendants' compensation databases. In analyzing the recruiting data, my staff standardized employer names in the recruiting databases to the extent possible. The "prior employer" field in the Defendants' data typically was self-reported by the applicant and was entered as free-form text.

¹⁹ Murphy Initial Report Exhibit 3, which showed the previous employers of hires into positions in the initially proposed "All Employee" Class and includes tables for all seven Defendants, showed similar results. No single firm (including no other Defendant) accounts for more than six percent of hires at any Defendant, and the top 20 firms combined typically account for less than 20 percent of total hires. Other Defendants account for at most three of the top 20 former employers at any Defendant, and collectively other Defendants typically account for less than three percent of total hires.

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Exhibit 3
Top 40 Previous Employers of Class Hires by Apple



Notes: [1] Analysis is restricted to hires into Class positions and periods for which Apple recruiting data are available

[2] Previous employers with the same number of hires are ranked alphabetically.

Sources: Apple recruiting data; Apple compensation data

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23. Plaintiffs' experts claim that the agreements affected compensation by limiting the flow of information. If hiring or, by logical extension, cold calling by one Defendant of another Defendant's employees were economically important in the price-discovery process, then employee movement between Defendants should account for a substantial part of the overall movement of a Defendant's employees. However, Exhibits 1, 2, and 3 and the analysis from my previous reports show that the opposite is true. Given the small amount of cross-hiring that occurs outside the period of alleged conspiracy, the amount of information lost and the potential impact on compensation received by members of the Class because of the challenged bilateral agreements would be extremely limited, both quantitatively and relative to changes in the marketplace, even if *all* hires and separations to and from Defendants were initiated by cold calls. This is true even before taking into account the incentive for recruiters to compensate for limitations on their ability to cold call into a few other firms by using other recruiting channels (and cold calling into other companies) more intensively.

24. The fact that other Defendants were not a predominant source of hiring is not surprising when one considers the types of skills possessed by employees at the Defendants. In some cases, other Defendants employed large pools of employees that specialized in an area that was of no interest to a Defendant. Pixar, for example, employed a large number of movie animators during the alleged conspiracy period. These employees likely had a set of skills that would not have been much use at Apple, which was not in the business of making motion pictures. A policy not to cold-call Pixar employees would not affect employees with skills of no interest to Apple recruiters. Similarly, Apple had employees who worked on consumer products such as the iMac iPad, iPod, and iPhone. Many of those employees likely had a set of skills that would not have been much use at Pixar, which was in the business of making computers of mobile devices.

2. Dr. Manning Wrongly Claims that the Amount of Cross-Hiring Is Irrelevant because it is Not a Good Proxy for "Potential Movement"

25. Dr. Manning claims that the small number of hires between Defendants is not evidence that the challenged agreements would have no meaningful impact on class-wide compensation because "it is not the actual movement that is important here, but rather the potential to move."²⁰ He further argues that as long as "one has a credible threat to move this is a useful tool in

²⁰ Manning Report at ¶51.

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obtaining higher compensation.”²¹ But one would expect “potential” and “actual” movement by employees between pairs of firms to be highly positively correlated. Dr. Manning claims otherwise, but he offers no explanation why a Defendant firm would account for a high share of employees’ “potential moves” or “credible threats to move” if it accounted for a very small share of actual moves. Nor does Dr. Manning even explain why the Defendant firms would be more rather than less important for information flows than the hiring flow data would imply.

26. In order for Defendants’ employees to account for a large share of potential moves but not of actual moves, there would have to be many more potential moves for every actual move between Defendants than between Defendants and non-Defendants (on average and relative to total employment). Dr. Manning provides no explanation or evidence why this would be true. It seems more likely that, if there are many (or few) cold calls or potential moves for every actual move, this would be true for both Defendants and non-Defendants. Even if employees of Defendants received twice as many cold calls from other Defendants as from non-Defendants (relative to actual movement), Defendants still would account for only about two percent of potential moves.

3. The Impact of the Challenged Agreements on Information Would Be Less than the Impact (if Any) on Employee Movement between Defendants

27. Plaintiffs’ theory of how members of the Class were harmed by the challenged bilateral agreements is not just about restricting potential employee movement between Defendants, but about reducing the flow of information to Defendants’ employees about their value in the marketplace.²² However, any impact of Defendants’ agreements on information flows would be even smaller than the impact on potential moves, because employees have many alternative sources of information about compensation and opportunities in the marketplace other than cold calls received from Defendants. Indeed, Plaintiffs have presented no evidence that cold calling is among the most important way in which employees learn about opportunities and compensation.

28. Dr. Manning criticizes the discussion in my previous reports about the many sources of information available to Defendants’ employees, instead claiming that information conveyed by

²¹ Manning Report at ¶51.

²² Manning Report at ¶¶8a, 8c, 17, 57, and 76. *See also* Leamer Initial Report at ¶¶11b, 68, 72-75, 90, and 113.

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a cold call must be higher quality than the information gained from, say, salary.com (to use Dr. Manning's example).²³ However, he provides no evidence to support this, or to show that there is *any* information about compensation conveyed in the typical cold call, let alone compensation information that is more reliable than what an employee could obtain in other ways, including by reviewing publicly available information or directly from friends of associates.

4. Summary

29. Evidence regarding Defendants' hiring and recruiting is not consistent with the challenged agreements having a meaningful impact on class-wide compensation. First, Defendants accounted for only a small share of moves to and from other Defendants (only 2.3 percent after the alleged conspiracy). Cross-hiring among the pairs of Defendants who are parties to the six challenged agreements accounts for an even smaller fraction of total hires before, during, and after the Class period. Second, many, if not most, moves between Defendants, and between firms more generally, likely were the result of recruiting methods other than cold calling and thus would not be affected by the challenged agreements.²⁴ Third, cold calling accounts for only a fraction of the information available to employees. Consequently, the challenged bilateral agreements would not reduce competition for Defendants' employees or cause any meaningful or systematic reduction in compensation of Class members.

IV. THERE ARE BUSINESS REASONS FOR APPLE TO ENTER INTO THE CHALLENGED AGREEMENTS THAT ARE UNRELATED TO REDUCING THE COMPENSATION OF APPLE EMPLOYEES

30. Plaintiffs and their experts disregard or dismiss commercial reasons unrelated to reducing compensation that explain why it was in Apple's interest to enter into bilateral DNCC agreements with certain firms or to adopt unilateral practices that restricted cold calling of employees from other companies.

A. Bilateral DNCC Agreements May Facilitate Collaborations between Firms

²³ Manning Report at ¶¶47-48.

²⁴ Because the number of moves between Defendants was roughly the same before, during, and after, the alleged conspiracy period, the challenged agreements appear to have had no meaningful impact on hiring between Defendants.

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31. One reason why firms may agree to restrict their ability to “poach” employees from another firm is because refraining from doing so facilitates collaborations. Collaborations and joint-ventures between firms can lead to innovations that provide substantial benefits to consumers.

32. Participating in joint ventures with other firms, especially product-market competitors, is not without risk. Firms risk losing control of trade secrets or intellectual property that they share with another firm during collaborations. They also risk losing valued employees that a partner can identify because of the parties’ collaboration, but who otherwise might not be easy to recognize. To alleviate these risks, firms may write contracts limiting the types of information that the firms will share and restricting how that information may be used. To prevent the loss of intellectual property, the parties may agree not to use each other’s intellectual property outside of the collaboration and may agree that neither party’s employees will disclose trade secrets. To prevent the loss of talented employees, firms may restrict the ability of a partner to approach and even hire the other firm’s employees. Absent such commitments, firms could have reduced incentives to collaborate, which may deprive consumers of the benefits of the unrealized collaborations.

33. In some cases, the concerns with losing intellectual property and concerns with losing talent maybe intertwined. Consider, for example, collaboration between Apple and Adobe. If some of the Apple employees who would add value by participating in a collaboration had highly confidential knowledge of Apple’s products or roadmaps, then Apple would have particular concern about losing them to Adobe. If Adobe poached such an employee from Apple, not only would Apple lose a valuable employee, but the employee also potentially could disclose to Adobe any confidential Apple information of which she was aware. Faced with this risk, Apple may decide that employees with knowledge of confidential information cannot participate in collaborations. If these employees would add value to the collaborations, then this could be a loss of value to the firms, workers, and consumers.

34. The loss of intellectual property and confidential information to collaborators is costly to firms in industries that are rapidly evolving (where intellectual property and roadmaps are highly valued). These may also be the same industries, however, where the gains to collaborations are the greatest. When technological advances are frequent and substantial, consumers benefit

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greatly when the firms making these advances work together to make use of each other's innovations and to ensure compatibility between their products. It is therefore very important for firms to find ways to alleviate the risks associated with collaborating.

B. Evidence Suggests that Apple Had Unilateral DNCC Practices in Addition to Bilateral DNCC Agreements

35. Plaintiffs claim the bilateral DNCC agreements were part of a conspiracy to suppress compensation. Apple documents and testimony suggest that some of Apple's DNCC practices were unilateral.²⁵ For example, evidence suggests that Apple had a unilateral practice not to cold call employees of firms whose senior managers served on Apple's Board.²⁶ Additional evidence suggests that Apple did not call into Nike because its CEO, Tim Cook, served on Nike's Board.²⁷ Some Apple vendors and strategic partners at Apple were also on its DNCC lists (e.g. Best Buy, Microsoft, Fry's),²⁸ and Plaintiffs have not challenged these practices as being part of a conspiracy. Because there could be no conspiracy if the practice were unilateral, the existence of unilateral DNCC practices suggests that Apple had reasons to restrict cold calling that were unrelated to the alleged conspiracy to suppress compensation.

36. For example, evidence suggests that Apple had a unilateral practice not to cold call employees of firms whose CEOs served on Apple's Board. There are several reasons that a firm would not want to actively poach the employees of a Board Director. First, cold calling employees from the firm of a Board Director could hurt the firm's relationship with that Board Director. It is important that Board Directors are acting in the best interest of shareholders, so the relationship between the Director and the firm is extremely important. It is in the best

²⁵ Apple's Amd. Resp. to Interrog. No. 15 at 10; Burke Deposition at 116:18-25; Bentley Dep. at 95:6-16; 231APPLE001164; Reeves Dep. at 50:20-51:9.

²⁶ Lambert Dep. at 21:7-8 ("we had an internal policy not to cold call into members of our board's companies"); Bentley Dep. at 61:21-62:2 ("they were unilateral decisions made on our side as it related to choosing not to cold call into companies we deemed strategic partners, or if there were board affiliations too sensitive to recruit into"). See also Baja Ex. 1204, 231APPLE031476 ("As a follow on to the above we have hands off policy with ... any senior level exec players from BOD companies."); Bentley Ex. 241 at 231APPLE037012 ("Do Not Call List" identifying "Genentech (CEO sits on our board)" and Intuit, JCrew, and Nike, with "common board members").

²⁷ Lambert Dep. at 184:25-185:11.

²⁸ 231APPLE079725; Reeves Dep. at 49:1-18; 231APPLE001164; Bentley Dep. at 99:3-9.

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interest of the firm to avoid actions that might violate that relationship and to take measures to ensure that no such actions occur.²⁹

37. Second, a practice of not cold calling avoids any actual or perceived conflicts of interest that arise from the Board Director's obligations to two firms.³⁰ The potential for conflicts of interests arising when an individual has leadership roles in multiple firms has been a concern of regulatory agencies. The SEC requires firms to disclose other Boards on which the firm's Board Directors serve. Per a 2010 amendment, the SEC now requires firms to disclose "any directorships at public companies and registered investment companies held by each director and nominee at any time during the past five years."³¹ These disclosure requirements are consistent with conflict of interest concerns—the same types of concerns that a bilateral DNCC agreement may address.

38. Third, a DNCC policy or practice may be in the firm's interest if, absent such a policy, the firm would be less willing to share information about specific employees or groups of employees with its Board. Withholding important information could impede the Board's ability to perform its role.

²⁹ Lambert Dep. at 235:1-4 ("from our perspective, it was really more of a -- it's being respectful to them. It's not putting them in a position of compromise given the information that they know").

³⁰ Dr. Marx states that "Helping a board member or key advisor avoid the appearance of impropriety ... is far different from ensuring the success of a technical collaboration." (Marx Report at ¶29d.) This may be true, but avoiding an actual or apparent conflict of interest is also far different from an intention to suppress wages which, according to Dr. Marx, must be the reason for the a bilateral DNCC agreement. (See Marx Report at ¶6d: "It is clear from the evidence that the Anti-Solicitation agreements were established for the purpose of suppressing compensation.") While facilitating success in collaborations is one commercial reason for a DNCC agreement, there may be other business reasons as well, such as maintaining good Board relations.

³¹ See Proxy Disclosure Enhancements, 17 CFR PARTS 229, 239, 240, 249 and 274, Securities and Exchange Commission, at p. 36 (<http://www.sec.gov/rules/final/2009/33-9089.pdf> accessed 11/22/2013): "We are adopting substantially as proposed the amendments to require disclosure of any directorships at public companies and registered investment companies held by each director and nominee at any time during the past five years. Item 401 presently requires disclosure of any current director positions held by each director and nominee in any company with a class of securities registered pursuant to Section 12 of the Exchange Act, or subject to the requirements of Section 15(d) of that Act, or any company registered as an investment company under the Investment Company Act. We believe that expanding this disclosure to include service on boards of those companies for the past five years (even if the director or nominee no longer serves on that board) will allow investors to better evaluate the relevance of a director's or nominee's past board experience, as well as professional or financial relationships that might pose potential conflicts of interest (such as past membership on boards of major suppliers, customers, or competitors)."

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V. DR. MARX MISCHARACTERIZES THE NATURE OF APPLE'S BILATERAL AGREEMENTS

39. In his "chronology of the alleged Anti-Solicitation agreements," Dr. Marx claims that there were three bilateral agreements involving Apple intended to suppress compensation.³² However, he does not provide a thorough analysis of the nature of the relationship between Apple and the three other Defendants with which it had DNCC agreements. Background on the nature of the relationship between Apple and each of the three other Defendants provides an alternative understanding (unrelated to reducing compensation) for the challenged agreements.

A. Adobe

40. Apple and Adobe have engaged in many collaborative endeavors resulting in innovative products for consumers, especially those in creative activities, over the past 30 years.³³ According to Apple, the companies' relationship originated in the early 1980s, when both were in the early stages of designing desktop publishing and other computerized creative tools.³⁴ Some consumers relied on Apple's Mac OS operating system and Adobe's software products,³⁵ so it was important for Adobe and Apple to ensure that those products worked together effectively.³⁶ According to Adobe, the combination of Adobe software and Apple hardware has transformed desktop publishing and the creative arts.³⁷

³² Marx Report at ¶16.

³³ According to Adobe, Adobe and Apple have entered into over 200 cooperative agreements with each other. (Adobe's Amd. Resp. to Interrog. No. 15 at 6). *See also* ADOBE_109433-110385.

³⁴ Apple's Amended Responses to Plaintiffs' Second Set of Interrogatories, Interrogatory No. 15 ("Apple's Amd. Resp. to Interrog. No. 15") at 7; Adobe's Amended Response to Plaintiffs' Second Set of Interrogatories, Interrogatory No. 15 ("Adobe's Amd. Resp. to Interrog. No. 15") at 5.

³⁵ Okamoto Dep. 94:24-95:2 ("So the relationship between Apple and Adobe is very close given the fact that at the time Apple's main business was the creative business, and Adobe created most -- or had most of the creative products available."); Chizen Dep. 37:15-23 ("We had joint customers that we both cared very deeply about, and we had to work together to make sure that the customer got the right solution...").

³⁶ Apple's Amd. Resp. to Interrog. No. 15 at 7; Okamoto Dep. 14:1-13 ("[W]e work very closely with Adobe with respect to making sure that the products that they create for both of our customers -- because, you know, there's Macs and there's Adobe products that run on Macs -- that they perform well, they're up to the latest specs what we have vis-à-vis hardware and operating system, and that the user experience of using their software on our products is something that, you know, again, it surprises and delights and makes them very happy").

³⁷ Adobe's Amd. Resp. to Interrog. No. 15 at 5.

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41. The companies' initial collaboration involved their co-development of Adobe's PostScript, a "programming language that enhanced communication between computers and printers," for Apple's LaserWriter printer in the mid-1980s.³⁸ Adobe explained that, at this time, it devoted almost all its resources to and obtained almost all its revenue from this joint work with Apple.³⁹

42. Since the LaserWriter project, Apple and Adobe have continued to collaborate on creative technologies, including work that is focused on the interoperability of Adobe's Creative Suite software applications and Apple's Mac and other products. According to Apple, this collaboration has helped ensure that users of the software obtain "peak performance on Apple's product lines."⁴⁰ Adobe's Photoshop software was originally released as a Mac-only product, and Adobe "has released more applications on the Mac operating system than virtually any company other than Apple."⁴¹ In addition to Photoshop, the Creative Suite applications have included Adobe's Illustrator graphics editor; "Premier move editing software; After Effects motion graphics software; PageMill, GoLive, and Dreamweaver web publishing software; InDesign and Pagemaker page layout software; and the Acrobat portable document software for the Apple platform."⁴²

43. According to Adobe, each launch of a new Creative Suite software application required the companies' close collaboration "on product design and optimization, education and support, and co-marketing and cross-promotion."⁴³ The companies explained that each release of an updated version of Adobe's software or a new version of Apple's operating system required

³⁸ Apple's Amd. Resp. to Interrog. No. 15 at 7; Adobe's Amd. Resp. to Interrog. No. 15 at 5; Warnock Dep. 23:3-4. The project required significant work and coordination between the two companies, including the integration of PostScript into the printer, monitoring and reacting to the printer's user controls, and ensuring that the printer could receive, queue, and process print jobs from the Mac effectively (Horner Dep. 89:21-90:13).

³⁹ Adobe's Amd. Resp. to Interrog. No. 15 at 5.

⁴⁰ Apple's Amd. Resp. to Interrog. No. 15 at 8; Warnock Dep. 256:14-258:18 (explaining that Steve Jobs "always wanted Photoshop to execute more quickly on the Apple than on the Windows machines," and consequently "would give us a great deal of help in making Photoshop really fast").

⁴¹ Adobe's Amd. Resp. to Interrog. No. 15 at 5-6; Apple's Amd. Resp. to Interrog. No. 15 at 8.

⁴² Adobe's Amd. Resp. to Interrog. No. 15 at 5-6; Apple's Amd. Resp. to Interrog. No. 15 at 8; Okamoto Dep. 67:10-70:2.

⁴³ Adobe's Amd. Resp. to Interrog. No. 15 at 6.

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“significant engineering and strategic planning” between the companies to ensure the products continue to work together optimally.⁴⁴ Ron Okamoto, Apple Vice President of Developer Relations and former Adobe Vice President of Product Marketing, explained that the “collaboration that we have going on between Apple and Adobe is pretty much ongoing, because they’re constantly updating their software, we’re constantly updating our operating system and our hardware,” and “any one of those events would have the need for collaboration for ... the products working well, being compatible, and that’s an ongoing thing.”⁴⁵ According to Apple, Adobe and Apple shared prototypes of software and hardware, source code, and other highly proprietary and sensitive information with each other during these collaborations.⁴⁶

44. The companies also collaborated in connection with Apple’s switch from PowerPC to Intel processors in 2005. Adobe was among the “most important of the third party software developers” to develop and deliver software for the new Intel-based platform, and it worked closely with Apple to implement the transition.⁴⁷ Witnesses from both companies characterized the microprocessor transition as “really, really, intense,”⁴⁸ and “having a dramatic impact on performance.”⁴⁹ Adobe explained that the companies engaged in similar joint development and planning for the transition of Adobe’s creative arts software applications to Apple’s iPhone and iPod,⁵⁰ and Adobe shared key intellectual property, including the source code of its core products Flash and Photoshop, with Apple to support these initiatives.⁵¹

45. Collaborations between Apple and Adobe have created consumer benefits from product innovations. Cold calling each other’s employees could have reduced the companies’ mutual

⁴⁴ Adobe’s Amd. Resp. to Interrog. No. 15 at 6; Apple’s Amd. Resp. to Interrog. No. 15 at 8.

⁴⁵ Okamoto Dep. 151:14-25.

⁴⁶ Apple’s Amd. Resp. to Interrog. No 15 at 8; Cook Dep. 45:9-12 (“Adobe was one of the very few, probably in some cases the only developer that would actually have Apple hardware prior to an announcement ...”).

⁴⁷ Apple’s Amd. Resp. to Interrog. No 15 at 8; Adobe’s Amd. Resp. to Interrog. No. 15 at 6.

⁴⁸ Okamoto Dep. 79:14-80:3 (“Because it is a massive back and forth between, okay, I did this, now this happened. Is that the right thing to happen? So there’s a lot of very detailed discussions that go on.”).

⁴⁹ Horner Dep. 159:23-160:7.

⁵⁰ Adobe’s Amd. Resp. to Interrog. No. 15 at 6.

⁵¹ Adobe’s Amd. Resp. to Interrog. No. 15 at 6.

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trust and hindered collaborations and product development.⁵² According to Apple's Mr. Okamoto, when Apple recruiters actually cold called into Adobe, this "made the relationship and the ability to both collaborate and cooperate a little bit sensitive. And what we wanted to make sure was that our partners were able to give us their best efforts, provide their best people, to make that critical transition without having the noise of cold calling as being part of the things that could potentially hold them back from doing that."⁵³

B. Google

46. Apple's collaborations with Google have led to innovations such as integration of Google Search into Apple's Safari web browser and Google Maps on the iPhone. According to Apple, its relationship with Google was one of its most important strategic partnerships, involving "numerous different collaborations."⁵⁴

47. Apple's initial collaborations with Google involved integrating a Google Search box into Apple's Safari web browser, with Google Search acting as the default search engine and as part of the Safari home page.⁵⁵ Safari was the first browser to incorporate a search field into its user interface, thereby allowing consumers to perform a search no matter what webpage they were on, without having to navigate to a particular search engine.⁵⁶ Mr. Croll explained that numerous Apple employees were involved in the project, including the engineering team that worked out

⁵² Apple's Amd. Resp. to Interrog. No. 15 at 8; Adobe's Amd. Resp. to Interrog. No. 15 at 6 (without its collaborations with Apple, Adobe's products would not have had the same quality or reached as wide of an audience as they did).

⁵³ Okamoto Dep. 18:18-19:4 and 193:13-24 ("And so if we have a situation where we're working together with an engineer, and then right after we're done, that engineer then gets a call from Apple, from a recruiter, without -- you know, they don't know them from Adam, and saying, hey, you know, is that -- you know, are you interested in a job over at Apple? They report back that -- you know, they can report that back to their management, and we might not get their best efforts or we might not get their best engineers because then they would say, well, what's the point of doing that if Apple is just cold calling these guys to try to get them to come over?").

⁵⁴ Croll Dep. 44:10-14. Mr. Croll served as a point person for Apple's interactions with a number of companies, but "nobody on the scale of Google. I mean, Google is a huge partner ... there's a lot of different companies, but nobody on the scale of a strategic partnership like Google." Croll Dep. 113:1-7.

⁵⁵ Apple's Amended Responses to Plaintiffs' Second Set of Interrogatories, Interrogatory No. 15 ("Apple's Amd. Resp. to Interrog. No. 15") at 9; Google's Responses to Plaintiffs' Second Set of Interrogatories, Interrogatory No. 15 ("Google's Resp. to Interrog. No. 15") at 9.

⁵⁶ Croll Dep. 88:2-13 (incorporating the Safari search box with Google Search "elevated the importance of Search, and it was the first browser to do that").

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how the technical protocols would operate, the marketing team that dealt with advertising and other aspects of the new product, and the legal team that worked out written agreements with Google regarding the relationship.⁵⁷ The collaboration between Apple and Google is shown in an Information Services Agreement in December 2002. Evidence suggests that this agreement was followed by amendments and extensions in January 2005, September 2007, July 2008, January 2009, and August 2009.⁵⁸ These written agreements covered the basic framework of the relationship, but Mr. Croll explained that many other details of the collaboration were worked out in day to day interactions.⁵⁹

48. Dr. Marx cites several documents that he characterizes as showing that Steve Jobs “expressed frustration with Google’s hiring of Apple employees.”⁶⁰ Each of these documents pertains specifically to Google’s recruiting of key engineers from Apple’s Safari team in early February 2005,⁶¹ right after Apple and Google had reaffirmed their collaboration on Safari and Search by signing the first amendment to the Information Services Agreement and Apple’s Safari team was actively engaged with Google’s engineering teams.⁶²

⁵⁷ Croll Dep. 87:13-24 (“Q. So who did the work to put the Google Search Box in Safari? A. A lot of different people. I -- for instance, I did the original agreement with Jeff Shardell and my legal team. The engineering team then worked out how the protocols would work between the search field and the Google service. Marketing team went through trying to figure out, you know, what -- how we could go ahead and put the Google search field -- it's actually the Safari search field with Google Search -- in our advertising and in our website and how we could market it, so it touched a lot of different people within the organization”).

⁵⁸ GOOG-HIGH-TECH-00625486; GOOG-HIGH-TECH-00625496; GOOG-HIGH-TECH-00625501; GOOG-HIGH-TECH-00625505; GOOG-HIGH-TECH-00625506; GOOG-HIGH-TECH-00625507.

⁵⁹ Croll Dep. 60:11-61:25 (“So the way we like to do agreements is to set up a framework for the companies to work together, but the real action happens in the interaction between the engineers. So typically what would happen in this kind of case, the engineers would get together and say, ‘Okay, so we have a legal umbrella, we’re good, now let’s get to work.’ And then we bring the engineering teams together; they start communicating and figuring out what’s the best way to do it.”); *see also* Eustace Dep. 116:5-15 (noting that “[w]e’re not a documentation rich company,” when questioned on the documentation of Google’s initiatives with Apple).

⁶⁰ Marx Report ¶ 16.b., citing deposition exhibits 557 (GOOG-HIGH-TECH-00293087), 1868 (GOOG-HIGH-TECH-00550729), 1869 (GOOG-HIGH-TECH-00550725), 1871 (GOOG-HIGH-TECH-00061052), and 199 (231APPLE002140).

⁶¹ Exhibits 557, 1868, 1869, 1871, and 199; *see also* Schmidt Dep. 48:17-49:14 (regarding exhibit 557, “this email is about our -- the allegation that we were recruiting a technical person from the Safari browser team to start our own browser”).

⁶² GOOG-HIGH-TECH-00625496.

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49. Brian Croll, Apple's Vice President of OS X Product Marketing, explained that the collaboration with Safari and Search in 2002 was "really the toe in the water to see how it went. It was very successful. So after that, we also then started looking at other ways we could collaborate with Google on a wider front."⁶³ As Apple's product line grew, the Safari browser with the Google Search field was incorporated into devices such as Apple's iPhone.

50. Apple and Google also collaborated on integrating other Google services with Apple hardware. For example, they worked to integrate Gmail into the Apple iPhone in a way that would make it easy for consumers to set up a Gmail account and allow emails from a user's Gmail account to be automatically downloaded to the Mail application on the iPhone,⁶⁴ and they worked to enable synchronization of a user's Google contacts into the iPhone.⁶⁵ During this collaboration, they agreed to exchange confidential contact synching source code.⁶⁶ According to Mr. Croll, this type of exchange of source code is relatively rare and demonstrated the companies' trust in one another and the depth of the collaboration.⁶⁷

51. Other products on which Apple and Google collaborated were Google Maps and Google's "My Location" functions" for the iPhone.⁶⁸ The companies explained that Apple was primarily responsible for the front-end user interface, while Google was responsible for contributing the underlying map data and service itself, but that they had to work together to integrate these components⁶⁹ and Apple needed access to Google's "GMM" source code for

⁶³ Croll Dep. 93:4-17.

⁶⁴ Apple's Amd. Resp. to Interrog. No. 15 at 10; Croll Dep. 56:11-15. Apple and Google granted each other access to various intellectual property rights need to carry out the project, in a Google Mail License Agreement dated May 2007. GOOG-HIGH-TECH-00625532.

⁶⁵ Apple's Amd. Resp. to Interrog. No. 15 at 10.

⁶⁶ See Contact Sync License Agreement dated January 2008 (GOOG-HIGH-TECH-00625631).

⁶⁷ Croll Dep. 146:1-147:14 ("I think this is a unique agreement, because it actually included source code, which is a very rare item in our agreements ... I know when you get source code, you know, it's like getting a -- an indecipherable book that you're going to need a lot of help figuring out what the -- how the source code works. So as a result, I can -- I would assume that there was quite a bit of collaboration going on between the engineering teams.").

⁶⁸ Apple's Amd. Resp. to Interrog. No. 15 at 10.

⁶⁹ Croll Dep. 115:23-116:7; Cook Dep. 62:3-22; Eustace Dep. 62:8-9 ("Maps was an example of something that was a shared product...").

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Maps.⁷⁰ Alan Eustace, Google's Senior Vice President of Knowledge, estimated that about 400 Google employees working specifically on the Maps integration in the 2007 period, which was a "complicated product" and required a "huge effort."⁷¹

52. Apple and Google also worked together to integrate content from YouTube, which Google acquired in 2006,⁷² into Apple products. Together, the companies developed a way for Apple TV to access and display YouTube videos and take advantage of other YouTube capabilities,⁷³ and they also developed a YouTube application for Apple's iPhone.⁷⁴ Developing the YouTube application required the companies to share confidential data, including YouTube's application programming interfaces ("APIs"), which defined how the software would communicate with YouTube's service.⁷⁵ In August 2007, Apple and YouTube entered an Upload API License Agreement, allowing Apple access to the necessary APIs. That agreement was amended and extended in May 2008, September 2008, and March 2009.⁷⁶ Google's Mr. Croll explained that "this is why the engineers need to get together, because you get the guy who designed, you know, the building behind the facade, and then our engineers, and then we can actually innovate, because we understand what's going on beyond a superficial specification."⁷⁷

⁷⁰ The details of this collaboration were set out in a series of license agreements between January 2007 and October 2009 (GOOG-HIGH-TECH-00625553; GOOG-HIGH-TECH-00625596; GOOG-HIGH-TECH-00625598; GOOG-HIGH-TECH-00625623).

⁷¹ Eustace Dep. 63:16-64:5 ("Maps is a complicated product. There's pieces having to do with serving map tiles, there's pieces that have to do with incoming streams of Map data, there's DigitalGlobe Satellite Imagery, there is Aerial Imagery that comes in, there's trying to make sure that the local information is correct. There's information on, you know, streets and, you know, one-way streets and things like that, so general map quality issues. There's putting local companies into our database and taking them out. It's a huge effort.").

⁷² Google 2006 10-K at 40.

⁷³ Apple's Amd. Resp. to Interrog. No. 15 at 10; Product Integration Agreement, May 2007, GOOG-HIGH-TECH-00625509.

⁷⁴ Apple's Amd. Resp. to Interrog. No. 15 at 10; Google's Resp. to Interrog. No. 15 at 9.

⁷⁵ Croll Dep. 67:15-25.

⁷⁶ GOOG-HIGH-TECH-00625707; GOOG-HIGH-TECH-00625722; GOOG-HIGH-TECH-00625724; GOOG-HIGH-TECH-00625725.

⁷⁷ Croll Dep. 68:7-69:8.

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The collaboration resulted in a “simple and elegant and much faster” method to search for and access YouTube videos.⁷⁸

53. The companies also collaborated on the open-source WebKit project, which provides the rendering engine for Apple’s Safari and Google’s Chrome browsers.⁷⁹ Apple explained that it contributed substantial coding and resources to the WebKit project, and engineers from both Apple and Google have worked closely on WebKit development projects such as source code modifications and security fixes.⁸⁰ According to Google, this collaboration led to advances in web standards and has allowed web applications to become increasingly sophisticated substitutes for traditional desktop applications.⁸¹ Apple has also worked with Google to incorporate Google’s anti-malware and anti-phishing into Apple software, including the Safari browser.⁸²

54. The success of these collaborations required the efforts of many different employees — in various different groups — at both Apple and Google. Mr. Croll explained that Apple had a huge number of people working on these collaborations.⁸³ He explained that those employees were not isolated to one or two groups at Apple, but instead were “marbled through the organization ... across many different parts of the company,” including software engineering, hardware engineering, marketing, business development, and finance.⁸⁴

⁷⁸ Cook Dep. 64:18-21; 66:1-3.

⁷⁹ Apple’s Amd. Resp. to Interrog. No. 15 at 10; Google’s Resp. to Interrog. No. 15 at 9; Schmidt Dep. 51:22-52:1; 68:15-19.

⁸⁰ Apple’s Amd. Resp. to Interrog. No. 15 at 10.

⁸¹ Google’s Resp. to Interrog. No. 15 at 9.

⁸² Apple’s Amd. Resp. to Interrog. No. 15 at 10; Croll Dep. 150:22-25. The arrangement was memorialized in a Protocol License Agreement in June 2006. *See* 231APPLE131210. Croll Dep. 151:19-24 (“we also talked quite a bit about what format it would take and whether we could find a standardized way of having anti-phishing services be able to plug in to a browser. So I remember there was quite a bit of back and forth with engineering teams about that”). Mr. Croll explained that the project required joint development of an interface between the anti-phishing service and the browser, with significant discussions between Apple and Google engineers (Croll Dep. 152:6-16 (“Our feeling was, is something like malware and anti-phishing helps everybody in the industry. It’s a way to defeat hackers. So we thought at the time, I remember this, that it would be good to make it standard so other vendors, for instance, other than Google could actually provide services on top of the Google services so that you could have multiple lists of bad sites that the browser could check against to protect the user.”))..

⁸³ Croll Dep. 45:13-15.

⁸⁴ Croll Dep. 76:4-77:15; *see also* Croll Dep. 45:16-22 (“it’s actually marbled through the organization, it’s so deeply integrated ... there’s just a ton of different touch points between the companies”), 46:1-5 (“it’s going to be a lot of people because it’s a wide range of different products and different sections of our organization”), and 95:12-

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55. In addition to Google's technical collaborations with Apple, Google's CEO, Eric Schmidt, served on Apple's Board of Directors from August 2006 until August 2009.⁸⁵ As discussed above, Apple had a longstanding practice to not cold call into companies associated with its Board members, both to avoid actual or perceived conflicts of interest and to facilitate trust with that Board member.⁸⁶

C. Pixar

56. Steve Jobs played an important role at both Apple and Pixar. Mr. Jobs co-founded Pixar with Ed Catmull in 1986, when Mr. Jobs purchased the operation from Lucasfilm.⁸⁷ Mr. Jobs stayed with the company through its early difficulties and continued to invest in its growth, including over \$50 million of his own funds.⁸⁸ He became more involved in Pixar's day-to-day business when the company prepared to go public in 1995,⁸⁹ and he served as Pixar's CEO, Chairman, and majority shareholder from 1997 until Disney's acquisition of the company in 2006.

57. After Pixar was acquired by Disney, Mr. Jobs became Disney's largest shareholder and a member of its Board of Directors.⁹⁰ He also was one of three Pixar members of the six-person Disney-Pixar Steering Committee. Pixar explained that this committee was formed, in part, to ensure that Mr. Jobs would remain intimately involved in Pixar's business operations.⁹¹ Pixar explained that, in this role, Mr. Jobs participated in bi-monthly meetings with Pixar regarding

18 ("The surface area of connection between Google and Apple was really large, and so there was a lot going on between the two different companies. And I don't think we had a central point where it all just came together and there was a master plan or anything like that. It was a very organic kind of working relationship, which is very common in how one develops technology.").

⁸⁵ *Google CEO Dr. Eric Schmidt Joins Apple's Board of Directors*, Apple Press Release, Aug. 29, 2006; *Dr. Eric Schmidt Resigns from Apple's Board of Directors*, Apple Press Release, Aug. 3, 2009.

⁸⁶ *Supra* section IV.b.; Apple's Amd. Resp. to Interrog. No. 15 at 10.

⁸⁷ <http://www.pixar.com/about/Our-Story> accessed 11/25/2013; Catmull Dep. 18:7-9.

⁸⁸ Catmull Dep. 67:15-68:3.

⁸⁹ Catmull Dep. 69:16-18.

⁹⁰ The Walt Disney Company 2009 Proxy Statement at 4 (Jan. 16, 2009).

⁹¹ Pixar's Supplemental Objections and Responses to Plaintiffs' Second Set of Interrogatories, Interrogatory No. 15 ("Pixar's Supp. Resp. to Interrog. No. 15") at 7.

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Pixar's operations and performance, and he played a crucial role in helping to preserve Pixar's innovative and creative culture generally and within the broader Disney community.⁹²

58. Mr. Jobs likewise played a crucial role in Apple's development, growth, and leadership. He returned to Apple in 1997, when the company was in great financial trouble after a decade of decline and had lost nearly \$2 billion in two previous years.⁹³ After Mr. Jobs' return, the company entered a period of great innovation and growth, experiencing an increase in its stock value from approximately \$4 a share in mid-1997 up to over \$190 per share by the end of 2009.⁹⁴ Mr. Jobs served as Apple's Interim CEO beginning in September 1997 and official CEO from 2000 until August 2011, and he also served on Apple's Board of Directors.

59. Mr. Jobs thus lead both Pixar and Apple at the same time, and was particularly well-positioned to identify each company's key talent.⁹⁵ If the companies were cold-calling each other's employees, Mr. Jobs' ability to perform his responsibilities at the two companies could have been impaired and his loyalty to each company called into question.⁹⁶

60. Although their core businesses were different, Apple and Pixar did work together on technical collaborations.⁹⁷ Apple provided Pixar with software and tools, such as the uTest software test tool and the source code for Apple's Shake software.⁹⁸ Pixar provided important

⁹² Pixar's Supp. Resp. to Interrog. No. 15 at 7.

⁹³ *Steven Paul Jobs, 1955-2011: Apple Co-Founder Transformed Technology, Media, Retailing and Built One of the World's Most Valuable Companies*, Wall Street Journal, Oct. 6, 2011.

⁹⁴ Yahoo! Finance, APPL Historical Prices, <http://finance.yahoo.com/q/hp?s=AAPL&a=06&b=1&c=1997&d=11&e=1&f=2009&g=m> (adjusted closing price of \$4.23 on July 1, 1997; adjusted closing price of \$190.45 on December 31, 2009).

⁹⁵ Apple's Amd. Resp. to Interrog. No. 15 at 10.

⁹⁶ Apple's Amd. Resp. to Interrog. No. 15 at 10; *see also* Pixar's Supp. Resp. to Interrog. No. 15 at 8 (discussing the "cooperation and collaboration in which Pixar and Apple engaged as a result of their close relationship," which was "assisted by the fact that the companies did not engage in cold-calling activity that could be harmful to that close relationship and disruptive to these beneficial collaborations"); Lambert Dep. 30:1-9 (Apple placed Pixar on its "do-not-cold-call list" because of Steve Jobs' role there), 50:5-9 ("with Steve Jobs being the CEO of the two companies and then through the acquisition of Disney and him coming on the board at Disney, that had to do with why we reached the agreement")

⁹⁷ Catmull Dep. 136:10-16. (Catmull testified that while Apple valued its confidentiality, Mr. Jobs' involvement facilitated "technical interchanges" between the two companies.)

⁹⁸ Apple's Amd. Resp. to Interrog. No. 15 at 11.

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feedback and input for Apple to improve and optimize these products,⁹⁹ and the companies' also worked together to ensure that Pixar software used to create and render movies could run well on Apple's Mac and OS X products.¹⁰⁰ Pixar explained that, when it began to develop the latest version of its proprietary animation software, MENV30, in the early to mid-2000s, Pixar received technical feedback regarding the software's design and testing,¹⁰¹ and that Pixar helped develop Apple's Pixlet video compression product and Apple's QTKit for image capture and recording of audio and video media content.¹⁰²

VI. DR. MARX APPLIES THE WRONG ECONOMIC FRAMEWORK IN EVALUATING THE COMPETITIVE EFFECT OF APPLE'S BILATERAL AGREEMENTS

61. An appropriate economic framework for evaluating the competitive impact of the challenged bilateral DNCC agreements is the following. First, I consider whether, as a matter of economic theory, the challenged agreements had the potential to have a meaningful impact on compensation of Plaintiffs' employees and whether there is any evidence that the challenged agreements had a meaningful impact on compensation of Plaintiffs' employees. As I explained above in Section III, each Defendant hired employees from a wide variety of sources, and other Defendants accounted for a very small share of hires. Even if the agreements prevented certain Defendants from hiring from each other (and Exhibits 1 and 2 show that that they did not), the impact on the overall hiring would be inconsequential because there are so many other sources of recruiting. In addition, as I explained above in Section III, I have found no economic evidence that the agreements had an effect on class-wide compensation.

62. Next, I consider whether the Defendants had a reason for entering into the challenged agreements absent any ability or intent to suppress employee compensation. While not strictly

⁹⁹ Apple's Amd. Resp. to Interrog. No. 15 at 11; Croll Dep. 52:17-23.

¹⁰⁰ Okamoto Dep. 165:11-166:3; Croll Dep. 52:6-16.

¹⁰¹ Pixar's Supp. Resp. to Interrog. No. 15 at 8:5-9. According to Pixar, Mr. Jobs was personally involved in the collaborative effort to develop the MENV30 software. ("When Pixar began development of the latest version of its proprietary animation software, MENV30, in the early to mid-2000s, its engineers worked with Apple engineers and received technical feedback regarding the software's design and testing. Mr. Jobs was personally involved in this collaborative effort.")

¹⁰² Pixar's Supp. Resp. to Interrog. No. 15 at 8.

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necessary in this case given the lack of the potential for an anticompetitive effect, as I describe above, Apple and other Defendants had reasons for entering into bilateral DNCC agreements that were unrelated to suppressing the compensation of their employees. Apple engaged in numerous collaborations with both Adobe and Google. In addition, Google's CEO, Mr. Schmidt, was on the Apple Board of Directors, and Apple had a unilateral practice of not soliciting from firms whose employees served on Apple's Board.¹⁰³ Finally, Apple had a unique relationship with Pixar because Mr. Jobs was the CEO of both firms—soliciting each other's employees could have created a conflict of interest for Mr. Jobs.

63. Dr. Marx does not apply this or another comparable framework. Instead, he concludes that the agreements were anticompetitive based on an alternative and improper set of criteria. According to Dr. Marx, one can conclude that agreements such as these harm competition unless 1) every bilateral DNCC agreement is tied to a specific corresponding technical collaboration, and 2) every technical collaboration is linked to a bilateral DNCC agreement.¹⁰⁴ However, neither of these criteria follows from economic principles or is a proper basis on which to evaluate whether the challenged agreements harmed competition. In particular, neither of these conditions, if false, would be sufficient to conclude that the challenged agreements suppressed compensation.

64. First, the fact that a bilateral DNCC agreement may not be tied to a specific and identifiable technical collaboration is not sufficient to conclude that the agreement was anticompetitive. A bilateral DNCC agreement that is not tied to a specific or identifiable technical collaboration suggests that the firms may have had reasons unrelated to a specific collaboration for entering into the agreement. As I discussed above, evidence that Apple did not cold call employees at firms of Board members is consistent with a bilateral DNCC agreement or a unilateral DNCC practice implemented to maintain good board relations or to prevent conflicts of interest. A firm might also seek a DNCC agreements to protect the intellectual property and other confidential information known to its key employees.¹⁰⁵ Dr. Marx does not discuss these

¹⁰³ Apple's Amd. Resp. to Interrog. No. 15 at 10.

¹⁰⁴ Marx Report at ¶25.

¹⁰⁵ Evidence that I have reviewed suggests that it was this concern that drove the October 2007 exchange between Mr. Jobs at Apple and Ed Colligan at Palm that Dr. Marx discusses. (See Lambert Dep. at 286:10-17, 287:9-14

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reasons that firms might adopt unilateral DNCC practices or enter into or seek bilateral DNCC agreements.

65. Second, Dr. Marx claims that only DNCC agreements connected directly to a specific collaboration are “rational.”¹⁰⁶ Evidence that some firms collaborated in the absence of a DNCC agreement is not sufficient to conclude that all DNCC agreements are anticompetitive. This simplified view ignores the fact that collaborations can vary greatly in size and scope and that each collaboration presents a unique set of challenges for firms to address. For some collaborations, a DNCC agreement may be necessary or beneficial, but for other collaborations, this may not be the case. Dr. Marx also ignores that companies may not know what direction current or future collaborations will take. The incentive for firms to adopt a bilateral DNCC agreement depends on factors such as the nature of their collaborations, the size and scope of the collaboration, the types of employees involved, the value that these employees have to their current firm, the likelihood of future collaborations, and the risk and cost of losing these employees to the collaborator. For example, a broad set of restrictions might be necessary for collaborations that are ongoing and that are difficult to define in scope, while a narrower set of restrictions might be sufficient if the collaboration is well-defined and limited in time. The fact that Apple may have collaborated with companies with which it had no bilateral DNCC agreement does not mean that all DNCC agreements are anticompetitive. The unique circumstances of one collaboration may create incentives for a bilateral DNCC agreement, where the different circumstances of another collaboration may not create those same incentives.

VII. DR. MANNING MISCHARACTERIZES MY PREVIOUS ANALYSES AND ALSO THE FACTS OF THE CASE

(“And we were quite concerned because [Mr. Rubinstein] had a ton of our confidential information. He knew very, very confidential information about all of our employees in our engineering space. He knew all of our product roadmaps, and he knew everything about our IP portfolio”); 295:12-16 (“[Mr. Rubinstein] had very, very confidential, sensitive information, as did, I’m sorry, Fred Anderson. ... He was our former CEO, so he had extremely privileged -- privileged information as well.”); Burke Dep. 112:1-11 (Mr. Rubinstein recruited multiple employees from Apple’s iPhone group after joining Palm, including Andy Grignon, Jeff Bush, and Mike Bell); Declaration of Edward T. Colligan, Ex. B at PALM00024 (“[O]ur employees ...are being actively recruited using knowledge supplied by Jon Rubenstein and Fred Anderson, with Jon personally participating in the recruiting process”)

¹⁰⁶ Marx Report at ¶25 (“If one takes this argument at face value, then a rational company should adopt Anti-Solicitation agreements if and only if undertaking a technical collaboration with another firm”).

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66. In his report, Dr. Manning relies on a combination of theoretical and empirical propositions to justify his ultimate conclusion that the alleged conspiracy “is likely to have suppressed competition in the labor market for [Defendants’] workers in a way that would be expected to have substantial effects on the compensation of those affected.”¹⁰⁷ First, he claims that labor markets are “imperfectly” competitive or “monopsonistic” because of limitations on information available to workers. As a consequence, he argues here (and has argued in his academic work), workers do not receive their “marginal revenue product,” meaning that they receive less compensation than their contribution to their employer’s output. According to his theory, any reduction in the amount of information available to workers about their “value” causes further divergence between their compensation and the competitive level of compensation.

67. Second, based on his review of documents and deposition testimony, Dr. Manning concludes that the purpose or intent of the DNCC agreements was to depress compensation below the level that workers would have received but-for these agreements. Part of his logic is that senior executives, including Defendants’ CEOs and Apple’s Steve Jobs in particular, knew about and approved these agreements. According to Dr. Manning, this level of involvement by senior executives would not be rational but-for the executive’s intent and ability to reduce compensation of their employees.

68. Third, based on his review of the expert reports that Dr. Leamer and I submitted during the class-certification proceeding, Dr. Manning concludes that Dr. Leamer’s regression analysis provides empirical evidence that compensation of class members was depressed during the period of the alleged conspiracy relative to what it would have been otherwise, and that my critiques of Dr. Leamer’s analysis are invalid.¹⁰⁸

¹⁰⁷ Manning Report ¶8.

¹⁰⁸ See Manning Dep. at 75:18-20 (“And I think the Dr. Leamer’s methodology is appropriate and so I think his estimates are the best estimates”) and at 348:4-6 (“I think Dr. Leamer’s estimates emerge as the best estimates we have.”). See also Manning Dep. at 76:21-77:4; 84:15-19; 87:9-11; 106:17-19; 108:4-6; 163:17-20; 181:18-21; and 190:20-22.

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69. Fourth, Dr. Manning claims that the Google “Big Bang” demonstrates the type of impact that he would expect but-for the alleged conspiracy – broad, across-the-board compensation increases for all class members.

70. None of Dr. Manning’s arguments have merit. Indeed, other than providing some new terminology (“monopsony”), Dr. Manning provides no new arguments, analysis or empirical evidence to support Plaintiffs’ claims that they were harmed, but merely relies on the same alleged “theory” of internal equity and information restriction, and the improper regression and other analysis, offered by Dr. Leamer.

71. I explain below flaws in Dr. Manning’s arguments.

A. Dr. Manning Wrongly Claims that I Assumed that Labor Markets are Perfectly Competitive and that My Opinions about the Impact of the Challenged Agreements Depends on that Assumption

72. According to Dr. Manning,

any analysis that rests solely on a view that perfect competition (with its assumption that information is perfect and job opportunities plentiful) is a good representation of the labor market is not reliable. In this regard the report of Dr. Murphy commits numerous errors of this type. For example, in opinion 3a, Dr. Murphy writes that “market price ... is determined by the supply and demand for labor. The alleged agreements affected neither the supply of nor the demand for labor....Therefore, there is no reason why they would affect market compensation.” What he writes is correct if the labor market is perfectly competitive and workers have complete information and no mobility costs. But the issue here is whether the conspiracy reduced the information available to workers in a substantive way, so assuming complete information is incorrect and misguided.¹⁰⁹

In making this argument, Dr. Manning not only mischaracterizes the analysis that I previously provided in this matter, but he makes clear his misunderstanding of the issues relevant for evaluating Plaintiffs’ claims, both as a matter of theory and in light of available empirical evidence.

¹⁰⁹ Manning Report ¶ 31.

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73. Nowhere in my reports or testimony did I argue that the labor market is perfectly competitive in the sense that each worker earns exactly his or her marginal revenue product. Labor markets have frictions—some workers are poorly informed, and there are a variety of individual characteristics and unobservable factors that determine the compensation earned by a particular employee. By the same token, firms have imperfect information because they do not know the actual value of a job applicant's labor until after the applicant has been hired. I note that four of the five named plaintiffs admitted exaggerating either their pay or their credentials when applying for jobs.¹¹⁰ Indeed, this is one of the primary reasons why Dr. Leamer's "conduct" regression is uninformative and the estimates of impact that he offered during the class certification phase of this proceeding were not statistically significant.

74. The question that I addressed, and the one that is relevant, is not whether the market diverged from some perfectly competitive ideal, but whether the challenged conduct (here, the bilateral DNCC agreements) had an impact on prices (here, the price of labor or compensation). In other words, the relevant question is did the DNCC agreements cause compensation of class members to be lower and thus further below their marginal products? The analysis of this issue that I offered in my class-certification reports and that I summarize above does not depend on an assumption that labor markets are perfectly competitive, but is equally informative if (as Dr. Manning claims) those markets are imperfectly competitive.

B. Empirical Evidence Shows that the Challenged Agreements Would not Affect Employee Compensation if Labor Markets are Imperfectly Competitive

75. The theoretical basis for Dr. Manning's (and Dr. Leamer's) claim that the small number of identified DNCC agreements between certain pairs of Defendants had meaningful, class-wide impact on employee compensation is their claim that the agreements reduced the amount of information available to employees without affecting information available to employers (thus exacerbating employee's disadvantage in compensation negotiations). In Dr. Manning's

¹¹⁰ Plaintiff Hariharan testified that when he applied to Lucasfilm, he inflated his salary at his then-current employer by more than 15 percent. Hariharan Dep. 136:24-137:9. Plaintiff Marshall testified that he repeatedly listed false dates on his resume regarding his past employment and exaggerated his work experience. Marshall Dep. 155:9-157:14, 182:16-184:12, 202:5-204:3. Plaintiff Stover testified that he misrepresented his dates of employment on his resumes. Stover Dep. 105:12-108:5, 113:5-114:5. Plaintiff Devine testified that he added to his resume a Bachelor of Fine Arts degree that he has not earned. Devine Dep. 190:6-191:9.

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“monopsony” formulation, employers retain more of the value created by their employees than they could in a but-for world with more cold calling between the pairs of Defendants. But, like Dr. Leamer, Dr. Manning ignores the fact that the “lost” information from a reduction in cold calling due to DNCC agreements would not, as a matter of economic logic, have any class-wide impact – let alone the impact that Dr. Leamer claims to measure with his regression analysis – on the compensation earned by class members.

76. In Section III above, and in my previous reports, I provided several data analyses that demonstrate why it is illogical to expect that there would be a meaningful impact on information flows, “internal equity” pressure and compensation adjustments from the small number of bilateral agreements challenged here. To summarize that analysis briefly:

- a) For each of the Defendants, only a small fraction (typically less than one percent) of hires historically came from another Defendant with which they are alleged to have a bilateral DNCC agreement (see Exhibit 1); as shown in Exhibit 3, Apple, which is alleged to have the greatest number of bilateral DNCC agreements, hired from a large number of different firms during this period, all of which would have contributed to the “information” available to employees at Apple and those DNCC firms;
- b) There is no economically meaningful difference between the amount of hiring from a DNCC firm compared with non-DNCC firms during the period of alleged conspiracy, compared with either before or after that period, as would have been expected if the DNCC agreements had an significant impact on recruiting from DNCC firms (see Exhibits 1 and 2);¹¹¹ and
- c) While there is no systematic information on the amount of cold calling, Apple and others used a variety of recruiting methods to identify and attract job candidates, and would have devoted additional resources to these alternatives if they received an

¹¹¹ At his deposition, Dr. Manning appeared to dismiss this comparison (“Q. Well, would it be useful sort of as a -- as a reality check to compare the cross-hiring in unrestricted period between two companies and the estimate of compensation effect that Leamer purports to find? A. No, really -- again, when we are comparing two -- two periods, which I think was in your question there, we have to make sure that we're comparing, you know, two periods that are comparable. And, you know, so a simple comparison like that, no, I don't -- “)(Manning Dep. 179:14-23). However, he did not explain why, even if there were differences in economic conditions in the period of alleged conspiracy compared with before or after, these differences would bias the relative cross-hiring measure.

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insufficient number of high-quality applications because of limitations on cold calling employees at certain companies.

77. It is informative to contrast these data with the anecdotal evidence that Dr. Manning offered to support his opinion that a few cold calls can cause a dramatic increase in compensation. At his deposition, he described his experience at The London School of Economics (“LSE”), where he is Professor of Economics. He explained that, in about 2012, another British University began “cold calling” LSE economics professors in an attempt to recruit them. According to Dr. Manning, this resulted in LSE increasing salaries of its junior faculty by “between 20 and 25 percent.”¹¹² However, his own description makes clear a critical difference in size and scope between the “market” for economics professors in Britain and the labor market at issue here. As Dr. Manning explained, “the academic labor market is a rather unusual labor market,”¹¹³ about 10 of the 50 LSE faculty were cold called and 3-4 actually left,¹¹⁴ and there were only about four British universities that were “serious competitors” for LSE’s economics faculty. Dr. Manning also explained that, at this time, one university, the University of Warwick, “was trying to move up the pecking order, that if it offered just a little more than LSE, LSE faculty probably wouldn’t move”¹¹⁵ and thus offered relatively large increases in compensation in an effort to “move up the pecking order” among British universities. Under these circumstances, the possibility that cold calling would cause an increase in compensation –even an increase for a group of faculty members – is hardly surprising; but the labor market at issue in this litigation is vast compared to that for economics professors in Britain.

78. During his deposition, Dr. Manning said that a direct empirical investigation of the impact of the DNCC agreements was not feasible because he lacked data on actual cold calling (and consequently on the extent to which cold calling by one Defendant of another Defendant’s employees was reduced during the period of alleged conspiracy).¹¹⁶ However, even without

¹¹² Manning Dep. at 17:19-24.

¹¹³ Manning Dep. at 22:21-25.

¹¹⁴ Manning Dep. at 22:21-23:4; and 33:22-24.

¹¹⁵ Manning Dep. at 31:17-21.

¹¹⁶ See, e.g., Manning Dep. 102:16-23.

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direct data on cold calling, it is possible to evaluate empirically the Plaintiffs' claims of a meaningful reduction in the flow of information. Indirect measures that relate directly to the challenged agreements, such as the extent to which one party typically hires from the other, are informative as to the potential impact of a restriction on recruiting, such as a bilateral DNCC agreement. It is unreasonable to expect that, if one firm never (or rarely) hired employees of another firm, an agreement between them not to cold call could meaningfully affect compensation at either firm. In addition, since cold calling is only one of the methods that firms use to recruit and workers use to obtain information, the degree of hiring will tend to overstate the effect of the DNCC agreements.

79. Dr. Manning's response to my empirical evidence that there was very little cross hiring between pairs of Defendants with DNCC agreements was to assert that the proof that the agreements affected compensation is that the agreements existed. According to him, the agreements must have affected compensation because otherwise they make no sense. However, as I explained above, Apple had reasons other than lowering employee compensation for these agreements, such as facilitating cooperative ventures with other firms or maintaining good Board relationships.

C. Under Dr. Manning's Economic Theory of Labor Markets, Compensation Is Determined by Supply and Demand

80. According to Dr. Manning, the proper theoretical framework for analyzing determinants of compensation is a "monopsony" model of the labor market. However, just as under a model that assumes perfect competition, compensation is determined in Dr. Manning's model by the supply and demand for labor. As he explains in one his papers, "the comparative statics of models of imperfect and perfect competition are the same in many cases so give the same answers to many questions. For example, shifts in the demand curve and supply curve of labor will be predicted to have the same effects in perfect and imperfect competition."¹¹⁷ While my analysis does not assume perfect competition, Dr. Manning acknowledges that such an assumption would be irrelevant to understanding how shifts in supply or demand affect compensation. Dr. Manning is wrong that the consequence of the agreements must be

¹¹⁷ Alan Manning, "Imperfect Competition in the Labor Market," in *Handbook of Labor Economics* (2011), p. 1021.

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“restricted” job opportunities for Defendants’ employees. At most, the opportunities are somewhat different (more internal and fewer external opportunities), but by itself this does not mean that there necessarily would be a reduction in compensation.

81. According to Dr. Manning, the bilateral DNCC agreements are “anticompetitive” because they “restrict[] the flow of job opportunities to one’s own employees”¹¹⁸ – in other words, Apple’s employees, for example, have fewer jobs from which to choose because, as a result of firms’ bilateral agreements with Apple, Apple employees are not being made aware of potential opportunities at Adobe, Pixar and Google. But if there were no impact on total employment at Adobe, Pixar and Google, then those firms’ employees must have an “increased flow of job opportunities” at their current employer, because they face less competition from potential recruits from Apple that otherwise might have received cold calls. In other words, under Dr. Manning’s own theory (the monopsony model), the direction of the impact is ambiguous. The challenged agreements reduce the outside options of the employees, which decreases the elasticity of supply of labor faced by the firm (from its own employees). But the agreements also reduce the number of potential employees available for the firm to employ, which causes the supply of labor faced by the firm to shift in. Under Dr. Manning’s theory, the former effect puts downward pressure on wages, but the latter effect puts upward pressure on wages. Dr. Manning has done no analysis of these off-setting effects and has not attempted to determine which effect dominates.

82. To state this differently, if the firm is unable to recruit through one channel, then it would increase its recruiting through other channels. Using Dr. Manning’s model, some employees in the Class would be better off because they would receive job opportunities that they would not have absent the challenged agreements. Again, this assumes, as Plaintiffs do, that the challenged agreements could have had a meaningful impact on the supply of labor at all, and I explained in Section III that this assumption is not valid.

D. Dr. Manning Wrongly Claims that Involvement of CEOs and Other Senior Executives in Monitoring DNCC Agreements Shows that the Purpose of the Agreements Was to Depress Compensation

¹¹⁸ Manning Report at ¶10.

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83. According to Dr. Manning, “it is clear that the [DNCC] agreements were regarded as important by senior executives of the Defendants. They were negotiated, confirmed and executed by top executives, not low-level managers or functionaries...The fact that CEOs of these companies felt the enforcement of the conspiracy important enough to spend their valuable time on is an indication that they perceived the agreements as being of consequence.”¹¹⁹ Dr. Manning views this as independent evidence that the bilateral DNCC agreements therefore affected compensation.¹²⁰

84. As an economic matter, one cannot infer the existence of impact on compensation from the firm’s willingness to adopt the agreements. As I discussed above, the firms have business reasons to enter into DNCC agreements absent any ability to suppress wages. The fact that a firm’s CEO was involved does not indicate an impact on compensation. Facilitating collaborations, retaining several key employees, etc. could have a value large enough to compensate for the CEO’s time. Even a desire to avoid “embarrassing” a fellow board member or business partner does not imply an impact on compensation, as CEO involvement in issues relating to board members and business partners could also have sufficient value to compensate for the CEO’s time.

E. Dr. Manning Relies Heavily on Google’s “Big Bang” For His Opinions, but Appears to Misunderstand the Facts Surrounding that Event

1. Analysis of Google’s Compensation Data Show that Big Bang did not Increase Average Total Compensation

85. Dr. Manning testified that Google’s “Big Bang” was an example of a firm increasing compensation in response to its employees receiving outside offers from another firm (Facebook).¹²¹

I mean it is important the question I was asked, is, are there cases in which a volume of cold calling leads to generalized increases in compensation? So we certainly do have one that this has happened. This is the Google big bang.¹²²

¹¹⁹ Manning Report ¶54.

¹²⁰ Manning Dep. 131:18-132:5; 133:5-22.

¹²¹ Manning Dep. at 106:3-12.

¹²² Manning Dep. at 103:8-13. *See also* Manning Dep. at 106:9-12; 116:16-18; 199:8-16; and 104:7-10.

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86. Dr. Manning relies on Google's Big Bang to support his conclusions that the challenged agreements suppressed compensation. He further relies on it to support his conclusion that Dr. Leamer's estimate of the impact is "the best estimate that we have."¹²³ However, Dr. Manning's claim that Big Bang increased total compensation of Google employees by ten percent is inconsistent with Google's compensation data. Based on my analysis of these data, I determined that total compensation at Google [REDACTED] from 2010 to 2011, the period in which Big Bang was implemented.

87. Dr. Manning's mischaracterization of Big Bang appears to be due to confusion between base salaries and total compensation. Total compensation, which is the compensation measure analyzed by Dr. Leamer in his conduct regression, includes base salary, bonuses, and equity grants (i.e., stocks and options). I agree with Dr. Leamer that this is the appropriate measure of compensation to analyze and Dr. Manning appears to agree with this as well.

I think that [equity grants are] part of them generally increasing compensation of which, you know, compensation has many different—a number of different components. They all go up to make, you know, how attractive it is to work for Google.¹²⁴

88. Exhibit 4 shows the growth in average annual base salaries and in average annual total compensation for Technical Class employees at Google from 2003 through 2011.¹²⁵ The exhibit shows that mean base salaries at Google [REDACTED]

[REDACTED]¹²⁶ The reason is that the value of non-cash

¹²³ Manning Dep. at 185:16. *See also* Manning Dep. at 364:16 and Manning Dep. 365:2-3.

¹²⁴ Manning Dep. at 192:3-7. It is unclear whether Dr. Manning thinks that Big Bang increased total compensation or if he believes that base salary is the appropriate measure of compensation. The referenced testimony suggests that Dr. Manning agrees that base salary is just one component that employees care about and, in his report, he states that Big Bang "raised *salaries* of all employees by 10%" (Manning Report at ¶69, emphasis added).

¹²⁵ I exclude 2001 and 2002 because Google offered very little equity compensation in those years. (*See* Murphy Initial Report Exhibit 8B.) The number of employees at Google in 2001 and 2002 was also very small. (*See* Murphy Initial Report Exhibits 2A and 2B.)

¹²⁶ *See also* Murphy Initial Report Exhibit 8B and Murphy Initial Report Appendices 4B and 4D.

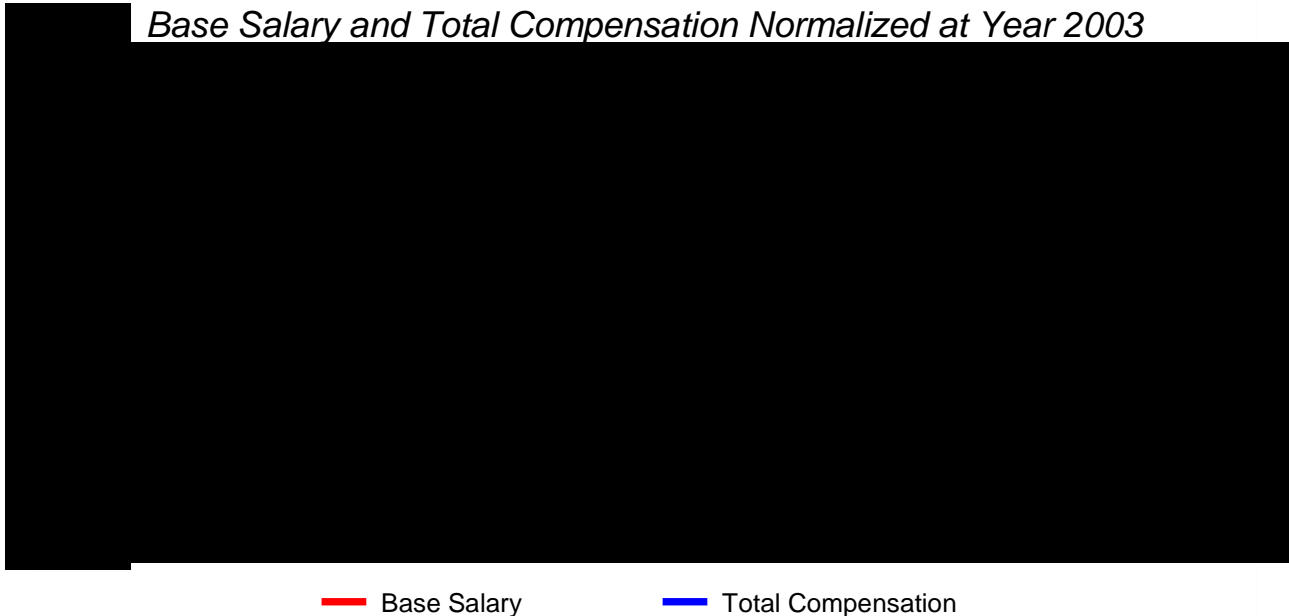
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compensation (i.e., stocks and options) [REDACTED]

[REDACTED] 127

Exhibit 4 Google's "Big Bang" Did Not Meaningfully Impact Total Compensation

Base Salary and Total Compensation Normalized at Year 2003



Notes:

[1] 2001 and 2002 are excluded because Google offered very little equity compensation in those years.

[2] Only Class positions are included in the analysis.

Source: Dr. Leamer 10/1/2012 Report backup data and materials.

89. These data suggest and documents produced by Google indicate that Google's Big Bang was an adjustment in employee compensation away from non-salary compensation and towards base salary compensation.¹²⁸ Dr. Manning wrongly ignores the decrease in equity in concluding

¹²⁷ The compensation data in Exhibit 4 are the same data that Dr. Leamer analyzed in his conduct regression. Dr. Manning testified that he believes that Dr. Leamer's conduct regression is a reasonable estimate of under-compensation because the impact is consistent with his understanding of what happened with Google's Big Bang. (See Manning Dep. at 116:16-21.) But Exhibit 4 shows that his characterization of Big Bang is inconsistent with these data.

¹²⁸ See GOOG-HIGH-TECH-00193305-08; GOOG-HIGH-TECH-00195571; GOOG-HIGH-TECH-00195367; and GOOG-HIGH-TECH-00194962. See also Murphy Initial Report Exhibit 8B. (Compared to the other Defendants, Google's compensation structure prior to Big Bang was more skewed towards equity grants. Murphy Initial Report Exhibit 8B shows the composition of total compensation for each Defendant and year from 2001 through 2011. As shown in the Exhibit, [REDACTED].)

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that Google's Big Bang supports his claim that the challenged agreements suppressed compensation of Defendants' employees.

2. Internal Google Documents Indicate that the Threat from Facebook and Other Startups Was Much Larger than the Threat of any Defendant Firm

90. Dr. Manning assumes that the only reason Google adjusted its compensation structure in late 2010 or 2011 is that its employees were receiving cold calls from Facebook.¹²⁹ Even if the threat of Facebook (and other startups) was a reason Google wanted to implement Big Bang, competition from Facebook and other startups in the labor market resulted in a change in market conditions and an increase in actual attrition, not simply a reduction in the flow of information to which Plaintiff's attribute their damages.¹³⁰ When labor market conditions change, it is improper to attribute any resulting change in market outcomes to changes in information. A change in market conditions would change compensation even if cold-calling had no incremental impact on compensation.

91. Dr. Manning also offers no evidence that any of the employees who left Google for Facebook were recruited through a cold call, or whether or not they could have left had Google had a bilateral DNCC agreement with Facebook. As I mentioned above, cold calling was just one channel through which employers acquired employees. As shown in Exhibits 1, 2, and 5 (below), the challenged agreements had no discernible impact on the number of employees that moved between firms with bilateral DNCC agreements. The number of workers who moved between two Defendants with a bilateral DNCC agreement was roughly the same before, during, and after the alleged conspiracy period. Assuming that Defendants did in fact stop cold calling each other during the alleged conspiracy period, then the continued movement of workers indicates that there were other channels through which Defendants acquired employees.

92. Big Bang notwithstanding, the only example of an increase in compensation posited by Dr. Manning is the compensation adjustment that his employer, LSE, gave to professors as a result of the recruiting efforts of competing universities. Here too, however, the intensity of the

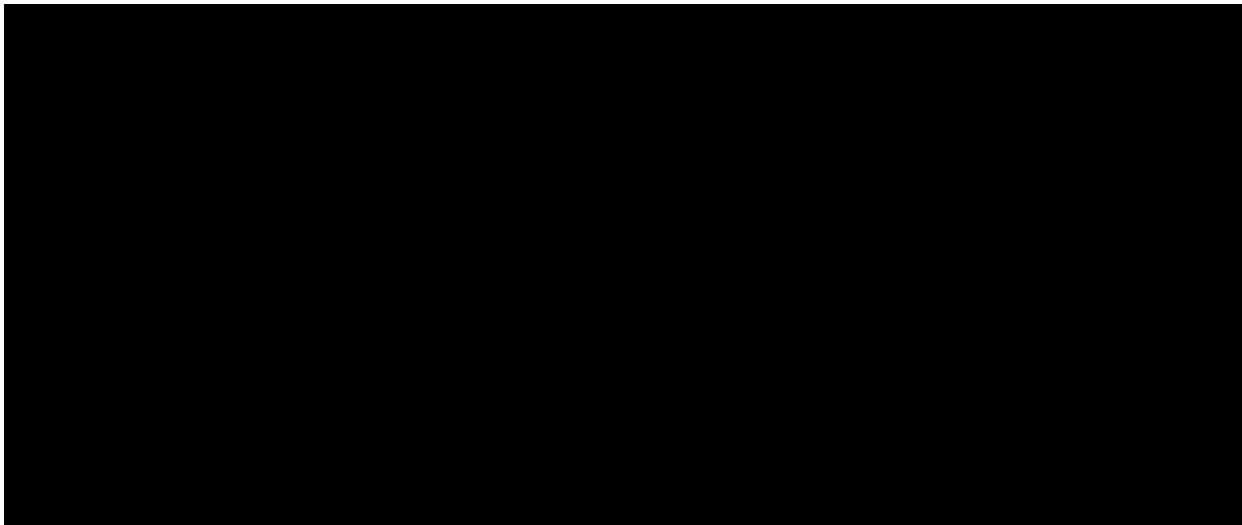
¹²⁹ Dr. Manning says that Google's salary adjustment took place around November 2010, but evidence from the compensation data suggest that it was implemented in 2011.

¹³⁰ A 2010 internal Google document states that, to date that year, █ percent of Google's technical employees who reported leaving Google for another company went to Facebook (and about █ percent went to startups). (See GOOG-HIGH-TECH-00193360.)

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competition appears to have been much higher than it was with Defendant firms. Dr. Manning testifies that the Economics Department at LSE lost its faculty to competing universities at a rate of roughly eight percent per year.¹³¹ As shown in Exhibit 5 below (for Apple) and in Appendix D (for the other six Defendants), an attrition rate of eight percent is much higher than the attrition rate from any one Defendant to another Defendant. At Apple, only a fraction of one percent of its technical class employees left for other Defendant firms before, during, and after the alleged conspiracy period.

Exhibit 5
Separations to Other Defendants Account for a Very Small Share of
Apple Employment and for a Very Small Share of Apple Separations
Class Positions



Notes:

- [1] A separation is classified as "To a Defendant" if he/she is employed by another Defendant within 12 months of separating from Apple.
- [2] Employees who return to Apple within one year of separating are excluded from the analysis.
- [3] Defendants classified as having a DNCC agreement with Apple include Adobe, Pixar, and Google.
- [4] The chart includes any employee who worked in a Class position if even the employee was not in a Class position at the time of separating.
- [5] Similar charts for the other six defendant firms are provided in Appendix D.

Source: Dr. Leamer 10/1/2012 Report backup data and materials.

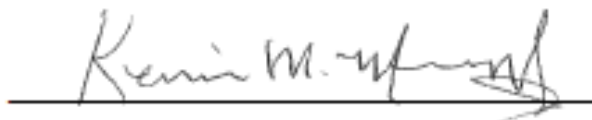
VIII. CONCLUSION

93. Based on my analysis, I have concluded that Apple's bilateral DNCC agreements that Plaintiffs' challenged would not have a class-wide impact on compensation. Neither Dr. Marx

¹³¹ Manning Dep. at 23:1-4.

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nor Dr. Manning provides any analysis to support Plaintiffs' claims that such an impact was likely or that class members generally were harmed by the agreements.

A handwritten signature in dark ink, appearing to read "Kevin M. Murphy", is written over a horizontal line.

Kevin M. Murphy

November 25, 2013